NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

IRRIGATION PIT OR REGULATING RESERVOIR

(No.)

CODE 552A

DEFINITION

A small storage reservoir constructed to regulate or store a supply of water for irrigation.

PURPOSES

This practice may be installed as part of a resource management system to support one or more of the following:

- Intercept and store water until it can be used beneficially to satisfy crop irrigation requirements.
- Conserve water by holding it in storage until it can be beneficially used to meet crop irrigation requirements.
- Provide incidental water for livestock, fish and wildlife, recreation, fire control, crop and orchard spraying, and other related uses.

CONDITIONS WHERE PRACTICE APPLIES

This standard applies to open pits excavated below the ground surface to intercept and store either surface water or unconfined groundwater for irrigation. It applies to pits if part of the water is impounded above natural ground, provided that the depth of water above the ground surface, as measured at the spillway crest elevation, does not exceed 3 ft.

This standard establishes the minimum acceptable level for the planning and functional design of irrigation pits. It does not include detailed criteria or construction specifications for individual pits or components of the storage facility.

This practice applies only to sites meeting all the following criteria and conditions:

1. The existing water supply available to the irrigated area is insufficient to meet conservation irrigation requirements during part of all the irrigation season.
2. Construction of an irrigation pit is the most practical means of obtaining a needed additional supply of water.
3. An adequate supply of good-quality water is available for storage from surface runoff, streamflow, or from a subsurface source.
4. Topographic, geologic, water table, and soils conditions at the site are satisfactory for the feasible development of the irrigation pit.
5. If surface runoff enters the pit, the contributing drainage area is or can be protected against erosion so that normal sedimentation does not materially shorten the planned life of the pit.

CRITERIA

Capacity

Irrigation pits shall be designed to have a usable capacity sufficient to satisfy irrigation requirements in the design area throughout the growing season of the crop or crops being irrigated. In computing capacity requirements, due consideration shall be given, where applicable, to groundwater inflow, surface runoff, precipitation, evaporation, and seepage. Additional capacity shall be provided as necessary for sediment storage. The usable capacity of a pit that

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depends wholly on groundwater as a source of supply shall be that part of the pit that is below the static water level.

Pit design

Irrigation pits shall be designed according to the criteria for excavated ponds in the standard for Ponds (378).

Outlet works

Suitable outlet works shall be provided for the controlled release of irrigation water. The capacity of the outlet works shall be no less than that required to provide the outflow rate needed to meet peak period irrigation system demands.

CONSIDERATONS

Water Quantity

1. Effects on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, deep percolation, and ground water recharge.
2. Effects on downstream flows or aquifers that would affect other water uses or users.
3. Potential for irrigation water management.

Water Quality

1. Effects on erosion and the movement of sediment, pathogens, and the soluble and sediment-attached substances carried by runoff.
2. Effects on the movement of dissolved substances to ground water.
3. Short-term and construction-related effects on the quality of downstream water courses.
4. Potential of uncovering or redistributing toxic material.
5. Effects on wetlands or water-related wildlife habitats.
6. Effects on the visual quality of water resources.

PLANS AND SPECIFICATIONS

Plans and specifications for irrigation pits shall be in keeping with this standard and shall describe the requirements for properly installing the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An Operation and Maintenance plan must be prepared for use by the landowner or operator responsible for irrigation pit operation and maintenance. The plan should provide specific instructions for operating and maintaining the pit to insure it functions properly. Minimum requirements to be addressed in the Operation and Maintenance Plan are:

1. Periodically inspect inlet structures, spillways and gates for proper functioning and for their ability to maintain design water levels. At approximately 3 month intervals exercise gates and valves to help assure proper function.
2. Maintain vigorous growth of vegetative coverings. Periodic mowing or controlled grazing may also be needed to control height.
3. Maintain fences to prevent unauthorized human or livestock entry.
4. Immediately repair any vandalism, vehicular, or livestock damage to any earth fills, spillways, outlets or other appurtenance.
5. Removal of debris that may accumulate in the pit and upstream or downstream from inlet and outlet facilities.
6. Eradicate or otherwise remove all rodents or burrowing animals and repair any damage caused by their activity.

REFERENCES

USDA NRCS, National Engineering Field Handbook for Conservation Practices, Chapters 3, 11, and 15.

USDA NRCS, National NRCS Technical Releases:

12 Procedure for Determining Sediment Storage Requirements for Reservoirs

60 Earth Dams and Reservoirs

USDA NRCS, Washington Irrigation Guide.

USDA NRCS, National Engineering Handbook Series.

USDA NRCS, Standard Drawings Handbook - Washington.